

Norepinephrine effect on myocardial contractility in rats at hypokinesia

Zaripova R., Gainutdinova K., Ziyatdinova N., Zefirov T.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, International Journal of Pharmacy and Technology. All rights reserved. Hypokinesia for warm-blooded animals and humans is a stressor agent, and the activation of the NO-system is one of the body mechanisms of reduction of stress influences. A prolonged hypokinesia causes significant changes in myocardial contractility and cardiac phases as a consequence of the formation of the phase syndrome of "myocardial hypodynamia". Objective of the research was to study the effect of hypokinesia on myocardial contractility in rats at administration of various doses of norepinephrine under blocking NO-synthases (NOS) and β -adrenergic receptors (β -AR). The effect of a non-selective agonist of adrenergic receptors - norepinephrine - was studied in the concentration range of 10^{-5} - 10^{-7} on atrial and ventricular myocardial contractility in mature rats of control (unlimited motor activity) and experimental (90-day hypokinesia) groups on the background of a NOS inhibitor - L-NAME at a dose of 10 mg/kg (intraperitoneally, 1 hour before autopsy) and β -AR blockade with Obsidan (0.1% solution at a concentration of 0.8 mg/kg), with the use of "PowerLab" ("ADInstruments") device, with the force sensor "MLT 050/D" ("ADInstruments"). The contractile force reaction in response to pharmacological agents was calculated in percentage of the original (100%). On the background of the β -AR and NOS blockade, the administration of norepinephrine at all studied concentrations causes a decrease in contractility of the strips of ventricular myocardium in both experimental groups. In the atria, the studied substance at a concentration of 10^{-5} M causes a slight increase in the contractility of myocardial strips.

Keywords

Heart, Hypokinesia, Inotropy, Postnatal ontogenesis